Method of Test for
DETERMINATION OF pH VALUE FOR AGGREGATES
DOTD Designation: TR 122-11

I. Scope

This method of test describes the procedure for determining the pH for aggregate samples.

II. Apparatus

A. **Container** – widemouth, nonmetallic, 2 oz or larger in size, glass beaker or leak proof cup.

B. **pH meter** – suitable for laboratory analysis with either one or two electrodes.

1. Before use, inspect the electrodes to ensure that they contain a saturated solution of potassium chloride. Check manufacturer's operating manual if electrodes require the addition of potassium chloride.
2. When the electrodes are not being used for standardization or testing, keep them immersed in distilled water. (See Note 1.)

Note 1: *Newer models of pH meters come equipped with a sleeve which is placed over the electrode during storage. If the electrode is supplied with a sleeve, a saturated solution of potassium chloride shall be placed in the sleeve. If the model is equipped with a sleeve the electrodes should not be placed in distilled water during storage.*

C. **Standard buffer solutions of known pH values** - use values of 5.0 and 7.0.

D. **Distilled water** – with a pH value between 6.5 and 7.0 that has been freshly prepared (or freshly boiled) and cooled to room temperature.

E. **Balance** – sensitive to 0.1 g.

F. **Thermometer**– (F or C corresponding to the temperature controller of the pH meter) having a maximum of 1º graduations which cover the range of temperature at which tests are to be conducted.

G. **Glass stirring rod**

H. **Graduated cylinder**

I. **Soft cloth**

J. **Wash bottle**

K. **Spoon or small scoop**

L. **Aggregate Test Report, DOTD 03-22-0745**

III. Sample Preparation

A. No special preparation is necessary for water sample unless soil is present. If soil is present, allow water sample to settle, then decant.

B. Prepare soil sample in accordance with DOTD Designation: TR 411, Method B – Dry Preparation of Disturbed Samples.

IV. Standardization of pH Meter

A. Inspect electrodes per manufacturer's instructions prior to use.

B. Standardize the pH meter daily before determination of pH values or at any time an instrument malfunction is suspected.

1. Use a standard buffer solution in the range of the pH of the sample to be tested, if such information is known

beforehand. Otherwise, begin with a standard solution having a pH of 7.0.

2. Pour 50 ± 5 cc of the solution into a clean beaker or cup.
3. Check the temperature of the solution and adjust the temperature controller of the pH meter accordingly.
4. Immerse the electrodes of the pH meter into the solution and gently swirl the container so as to obtain good contact between the solution and the electrodes.
5. Allow the electrodes to stand in the solution for 15 seconds before reading the pH value. (See Note 2.)
6. Read the pH value on the meter. If the value does not read the pH of the solution being used for standardization, adjust the pH meter to read the known pH (5.0 or 7.0).
7. Remove electrodes from the solution, rinse well with distilled water and wipe lightly with a soft cloth. Discard used buffer solution.

V. **Procedure**

A. Determination of pH Value of aggregate backfill.

1. Obtain a test specimen of aggregate weighing 50 ± 0.5 g and place into a clean beaker or cup.
2. Add 250 ± 5 cc of distilled water to the beaker or cup containing the test specimen.
3. Stir the test specimen solution vigorously to disperse aggregate uniformly in water.
4. Stir the test specimen solution at approximately 15 minute intervals for a period of one hour in order to disperse the aggregate and make sure all soluble material is in solution.
5. Record the beginning time and the time of each stirring on the worksheet.
6. Check the temperature of the test specimen solution and adjust the temperature controller of the pH meter accordingly.
7. Immediately before immersing electrodes into the test specimen solution, stir the solution then remove the glass stirring rod.
8. Immerse electrodes into the solution and gently swirl the container so as to obtain good contact between the solution and the electrodes.
9. Allow the electrodes to stand in the test specimen solution for 15 seconds before reading the pH value. (See Note2.)
10. Read the pH value. If the pH value is within ± 2.0 of the buffer solution used, record on the worksheet to the nearest 0.1 as pH value of sample. If the pH value is not within ± 2.0, restandardize the pH meter using the other buffer solution and rerun the test.
11. Remove electrodes from the test specimen solution, rinse well with distilled water. Wipe lightly with a soft cloth to remove any film formed on the electrodes.

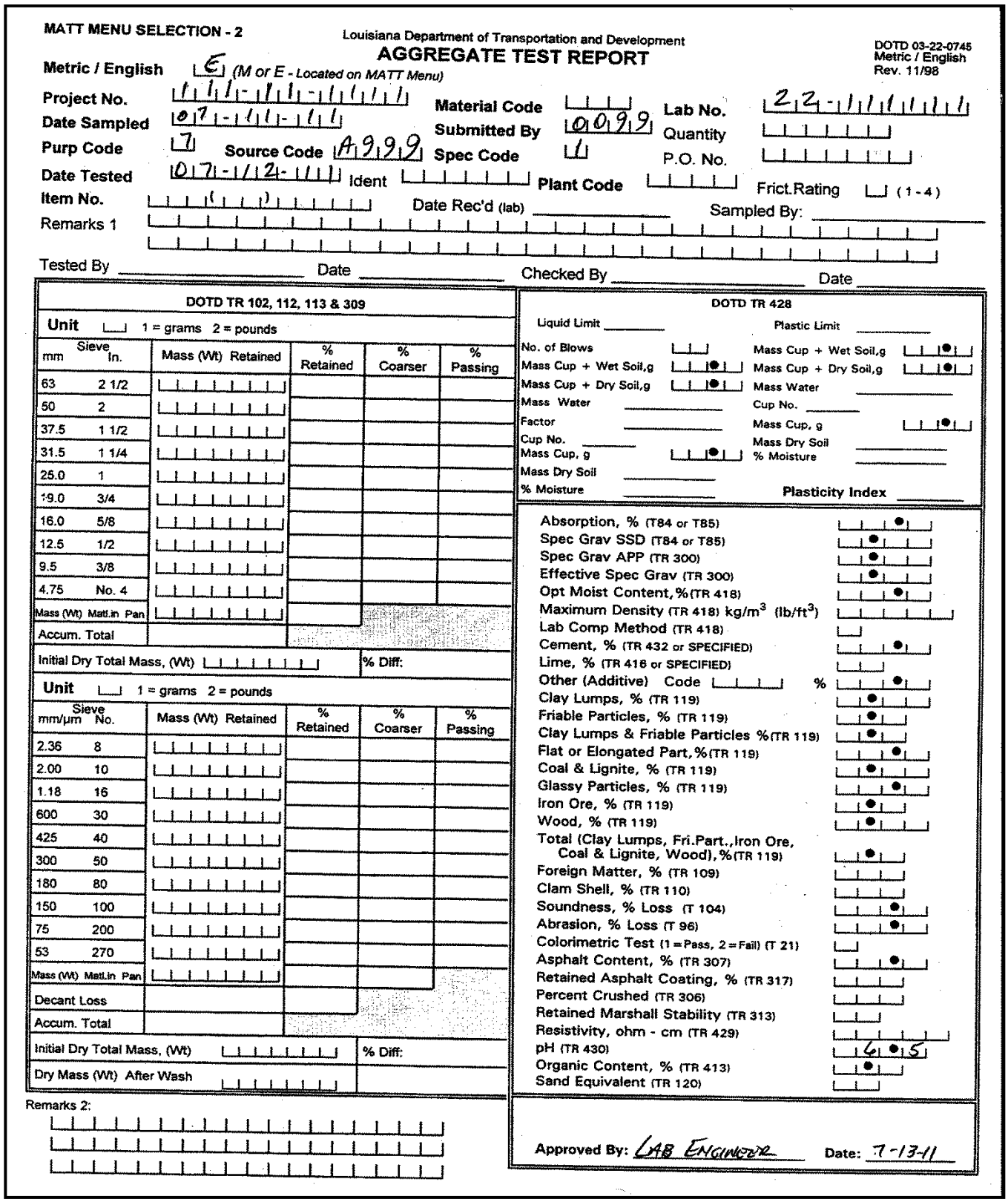
Note 2: *If the pH reading appears unstable when the electrodes are immersed in the buffer solution or test specimen, leave the electrodes immersed until the pH reading has stabilized. In some cases, the waiting period for the stabilization of the pH reading may take 5 minutes or more.*

VI. **Report**

A. For aggregate samples, the test information reported shall include the beginning time of test, the time of each dispersal and the pH value recorded to the nearest tenth (0.1). The pH value for individual samples shall also be reported on the Aggregate Test Report form (See Figure 1).

VII. **Normal Test Reporting Time**

Normal test reporting time is 24 hours.



MATT MENU SELECTION - 2

Louisiana Department of Transportation and Development

AGGREGATE TEST REPORT

DOTD 03-22-0745
Metric / English
Rev. 11/98

Metric / English: E (M or E - Located on MATT Menu)

Project No. 11-111-1111111

Date Sampled 07-111-111

Purp Code 7 Source Code A9999

Date Tested 07-12-111 Ident

Item No. (111)

Material Code 0099 Submitted By

Spec Code 1

Lab No. 22-1111111

Quantity

P.O. No.

Plant Code

Frict.Rating (1 - 4)

Date Rec'd (lab)

Sampled By:

Remarks 1

Tested By Date

Checked By Date

DOTD TR 102, 112, 113 & 309

Unit 1 = grams 2 = pounds

Sieve mm	Sieve in.	Mass (Wt) Retained	% Retained	% Coarser	% Passing
63	2 1/2				
50	2				
37.5	1 1/2				
31.5	1 1/4				
25.0	1				
19.0	3/4				
16.0	5/8				
12.5	1/2				
9.5	3/8				
4.75	No. 4				
Mass (Wt) Matl.in Pan					
Accum. Total					

Initial Dry Total Mass, (Wt) % Diff:

Unit 1 = grams 2 = pounds

Sieve mm/µm	Sieve No.	Mass (Wt) Retained	% Retained	% Coarser	% Passing
2.36	8				
2.00	10				
1.18	16				
600	30				
425	40				
300	50				
180	80				
150	100				
75	200				
53	270				
Mass (Wt) Matl.in Pan					
Decant Loss					
Accum. Total					

Initial Dry Total Mass, (Wt) % Diff:

Dry Mass (Wt) After Wash

Remarks 2:

DOTD TR 428

Liquid Limit Plastic Limit

No. of Blows		Mass Cup + Wet Soil,g	
Mass Cup + Wet Soil,g		Mass Cup + Dry Soil,g	
Mass Cup + Dry Soil,g		Mass Water	
Mass Water		Cup No.	
Factor		Mass Cup, g	
Cup No.		Mass Dry Soil	
Mass Cup, g		% Moisture	
Mass Dry Soil			
% Moisture			

Plasticity Index

Absorption, % (T84 or T85)	
Spec Grav SSD (T84 or T85)	
Spec Grav APP (TR 300)	
Effective Spec Grav (TR 300)	
Opt Moist Content, % (TR 418)	
Maximum Density (TR 418) kg/m³ (lb/ft³)	
Lab Comp Method (TR 418)	
Cement, % (TR 432 or SPECIFIED)	
Lime, % (TR 416 or SPECIFIED)	
Other (Additive) Code %	
Clay Lumps, % (TR 119)	
Friable Particles, % (TR 119)	
Clay Lumps & Friable Particles % (TR 119)	
Flat or Elongated Part, % (TR 119)	
Coal & Lignite, % (TR 119)	
Glassy Particles, % (TR 119)	
Iron Ore, % (TR 119)	
Wood, % (TR 119)	
Total (Clay Lumps, Fri.Part., Iron Ore, Coal & Lignite, Wood), % (TR 119)	
Foreign Matter, % (TR 109)	
Clam Shell, % (TR 110)	
Soundness, % Loss (T 104)	
Abrasion, % Loss (T 96)	
Colorimetric Test (1 = Pass, 2 = Fail) (T 21)	
Asphalt Content, % (TR 307)	
Retained Asphalt Coating, % (TR 317)	
Percent Crushed (TR 306)	
Retained Marshall Stability (TR 313)	
Resistivity, ohm - cm (TR 429)	
pH (TR 430)	6.5
Organic Content, % (TR 413)	
Sand Equivalent (TR 120)	

Approved By: LAB ENGINEER Date: 7-13-11

Figure 1
Aggregate Test Report (03-22-0745)